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JOHN SCOFIELD, NATIONAL GEOGRAPHIC STAFF

HEAPED PAPAYAS line the market dock at Port-au-Prince, Haiti's capital and chief port

HISPANIOLA, CARIBBEAN'S DIVIDED ISLAND

► Majestic Relics of Scotland's Past

► Pittsburgh Wears a New Face

► An Intimate Look at the Bee 37

UMI

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Often the woman will start from home during the afternoon, arriving in the market place during the night and sleeping on the market steps. The market opens at the first glimmer of dawn, and the bargaining begins, fervently, but in good humor. Women sell papayas (see cover) in the waterfront market of Port-au-Prince, Haiti's capital and largest town.

Below, the New World Negro walks streets lined with French-style buildings in the plaza of Miragoâne, where women gather to begin the day's selling.

If her vegetables bring good prices, her load may be equally heavy on the return trip: cooking oil, fish, biscuits, denim for clothing, incense, boxes of matches, and, always, tidbits of gossip.

Haiti's official language is French. Most Haitians, however, speak a patois called Creole, a mixture of old French, African dialects, Spanish, and English.

The official religion is Roman Catholic, but the peasant also practices voodoo, a primitive combination of myth and magic inherited from his African ancestors. Beginning at 10 in the evening, the eerie beat of the voodoo drums echoes from the hills near Port-au-Prince.

In contrast to the Haitian peasant is the small upper class—a group of cultured, well-educated mulattoes and more recently "arrived" darker-skinned men. In the most aristocratic homes a dinner party means many courses and wines, formal dress, and conversation in purest French on the acting subtleties of the Comédie Française.

Haiti was once one of France's richest colonies. But independence in 1804 destroyed the colonial economy. The big sugar plantations which had earned the wealth were divided into small plots. Roads and irrigation systems built by the French deteriorated through neglect, and progress passed Haiti by.

Some sugar, along with coffee, cotton, and sisal is still grown for export, but most farmers can grow only enough food to live on. A few cooperative farms attempt to reestablish the efficiency lost in the breakup of the colonial plantations. Only about one-third of the country's 10,714 square miles can be farmed. The few recent irrigation projects still leave much of the land unusable.

NATIONAL GEOGRAPHIC PHOTOGRAPHER B. ANTHONY STEWART

Mineral wealth is largely undeveloped. The only industries are connected closely with agriculture: a sugar refinery at Port-au-Prince, sisal and textile mills.

Haiti's woes do not stop with poverty. The country is also largely illiterate. It is overcrowded, and, although it won independence from France more than 150 years ago, political chaos has marked most of the nation's course. Periods of honest, orderly democratic government have been few and far between.

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HAITI

Negro Republic Of the Caribbean

JOHN SCOFIELD, NATIONAL GEOGRAPHIC STAFF

HAITIANS consider a man who owns a cow a success. Only the well-to-do can afford such a large animal. Even horses and burros are scarce, and most transportation is on foot.

The people of this Negro republic are poor. They live in a land of rugged mountains and deep valleys punctuated only occasionally by good farmland. Even its name means high hills.

The average Haitian farmer—about 90 per cent of the nation's 3,384,000 people make their living from the land—lives in a home of wood and mud with a roof of palm branches, or walled with plaster over laths and thatched with good straw. If he comes by a little more money, perhaps he will build himself a $50 two- or three-room plastered house with a ceiling and wooden floors, a tin roof, and a porch. He sleeps on a mat of banana branches and cooks outdoors over three stones and a brazier. His usual daily fare: a breakfast of black coffee and one cooked meal.

He owns neither plow nor wheelbarrow. On his acre or so, he may plant Congo peas, millet, yams, corn, rice, red beans, sweet potatoes, and manioc. He may have such fruit trees as mango, papaya, plaintain, avocado, or lime. He grows the same crops year after year on the same piece of land. When his yield gets very low, he plants his crops on a near-by plot until fertility is restored. He may also have a few chickens and pigs, a dog, and some goats.

His wife's work is never done. Although she does not work in the fields the way her African ancestors did, taking care of the family and animals is a full-time job. She must often carry water from great distances. Laundry day means beating the clothes with a club at the river bank.

She is the family shopper and shopping cart. The market may be 25 or 30 miles away, but she trudges the distance week after week with 60 to 80 pounds of fruit and vegetables balanced on her head (above).

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PHOTOGRAPHS BY NATIONAL GEOGRAPHIC PHOTOGRAPHER B. ANTHONY STEWART

place. Modern roads thread the nation.

Affluence in the Dominican Republic is new. With independence from Spain in 1821 came a long period of turbulence: frequent uprisings, economic ills, and general dissatisfaction. Finally, in 1916, after revolutionists deposed the elected president, United States Marines occupied the country.

The Marines stayed for eight years. In 1924 the nation regained its sovereignty, held an election, and borrowed money from the United States for highway construction, irrigation systems, and other works.

The economy picked up momentum in 1930 with the election of General Rafael Trujillo Molino to the presidency. The general has ruled ever since, directly or indirectly—but always with an iron hand.

One-man rule gave the people an increasingly higher standard of living. After the 1930 hurricane razed the capital, Santo Domingo, one of the oldest permanent white settlements in the Western Hemisphere, Trujillo rebuilt it along modern lines and named it after himself.

He gave his people pure drinking water and fought to stamp out disease. New schools cut down illiteracy. Agriculture, mainstay of three-quarters of the country's more than 2,791,000 people, became more profitable. Irrigation systems were built. Small farmers were encouraged to obtain loans and buy modern machinery. The government also backed the formation of farm colonies which now produce thousands of cattle, pigs, goats, sheep, mules, horses, poultry.

For their material progress, however, the people paid a high price—their liberty. Trujillo tolerates no word of criticism. No opposition faces the nation's one political party—the dictator's. The government controls the press, radio, and television. There is no freedom of speech or assembly. L.B.

UMI

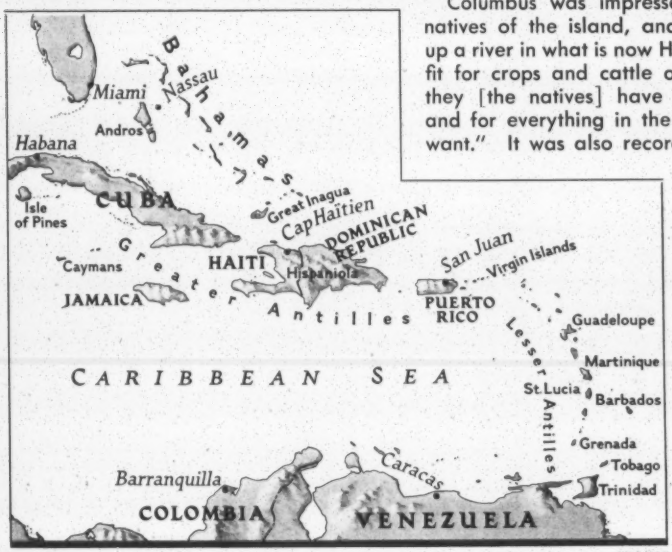
Hispaniola

YOU GREET A FRIEND on the western end of Hispaniola with "Bonjour." On the eastern end you say "Buenos dias." It is the only island in the world containing two independent nations. It is the island Columbus loved—a tropical land of hot days and cool nights, its shores washed by the Atlantic Ocean and the Caribbean Sea.

The French-speaking Negro Republic of Haiti occupies the western third of Hispaniola's 30,000 square miles—an area about the size of Vermont. Two-thirds of the nation is mountainous. Many farmers dig a living out of hillsides so steep that both man and plant must struggle for a foothold. Large areas are arid. Only one-third of the country can be tilled. Yet 3,384,000 people live in these inhospitable 10,714 square miles—an average of 316 persons per square mile. Such areas as the Marbial Valley support more than twice as many—one of the densest rural populations in the world.

Across the 193-mile frontier lies Haiti's more fortunate neighbor, the Spanish-speaking Dominican Republic, occupying nearly two-thirds of the island—an area slightly larger than Vermont plus New Hampshire. The Dominican Republic's 18,816 square miles, much of which is fertile, supports 2,791,000 people—only 142 per square mile.

Columbus discovered the island in 1492 and named it *La Isla Española* because it reminded him of southern Spain. Geographers later corrupted the name into Hispaniola.



NGS MAP

Columbus was impressed with the friendly natives of the island, and had himself rowed up a river in what is now Haiti. He found "lands fit for crops and cattle of all sorts (of which they [the natives] have none), for orchards, and for everything in the world that man can want." It was also recorded that "Hispaniola is a marvel; the mountains and hills . . . so beautiful and rich. . . . There are many spiceries, and great mines of gold."

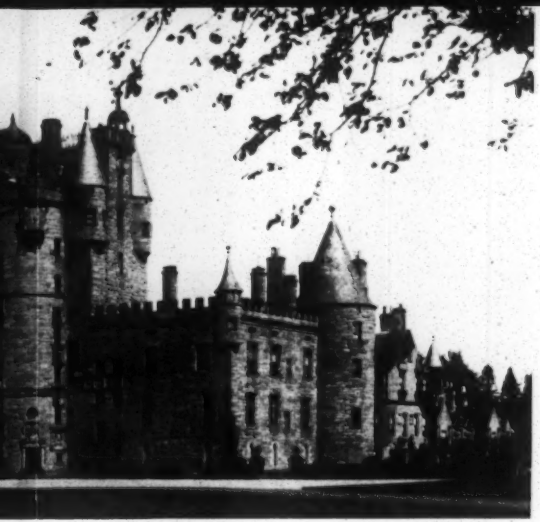
The islanders had "very many canoes . . . some of them holding 40 to 45 men. . . . With these they navigate through all those islands, which are numberless, and ply their traffic."

Dominican Republic, the Favored Portion

COMPARED TO neighboring Haiti, the Dominican Republic is well-to-do.

The ornate architecture of 16th century Spanish settlers—many of whose buildings have withstood earthquakes, hurricanes, and time—stands beside gleaming white structures of the 20th century. An obelisk, commemorating the capital's reconstruction after a 1930 hurricane and heading the Avenida George Washington, resembles our Washington Monument. Below, the new and the old: Coffee drinkers take their morning cup in modern Ciudad Trujillo; in the countryside women cook in iron pots over a wood fire.

Factories rise, and mining companies explore the country's latent mineral wealth. At newly-improved ports, ships load coffee, sugar, cacao, tobacco, and sisal. Rice, once imported, is now exported. Slums disappear. Neat housing projects take their



DONALD MC LEISH

players: two long-dead lords and the Prince of Darkness—the Devil himself.

On the same site, legend says, Macbeth, Thane of Glamis, murdered his guest, Duncan, King of Scotland.

On December 3, 1540, a Lady Glamis (pronounced *Glahms*), imprisoned in Edinburgh Castle, was burned to death on a trumped-up charge of witchcraft because King James V hated her brothers. While she was in prison, James held court at Glamis and stole many of its valuable furnishings and silver.

Most castles tower on heights that offer commanding views of the surrounding countryside and the most limited approaches. Tantallon, at the mouth of the Firth of Forth, stands on a cliff 100 feet above the sea. In 1528, James V attacked the castle with 20,000 men, artillery, and a battering ram, but his 20-day siege failed.

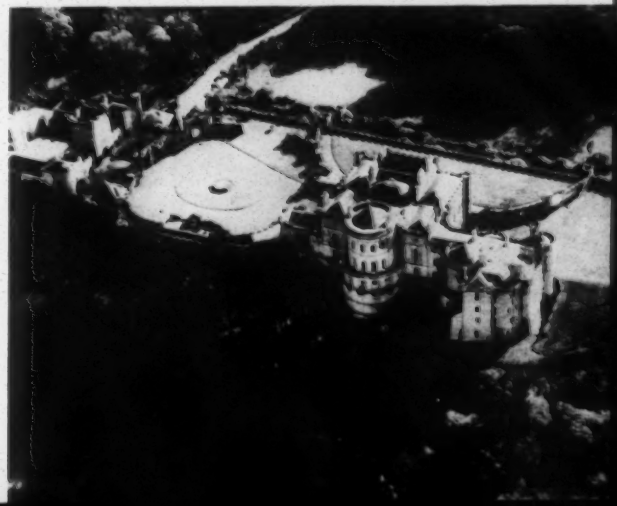
The earliest castles were simple circular palisades on hilltops. Later, stone castles included towers, courts, gardens, gatehouses, stables—all the buildings necessary for a self-contained stronghold.

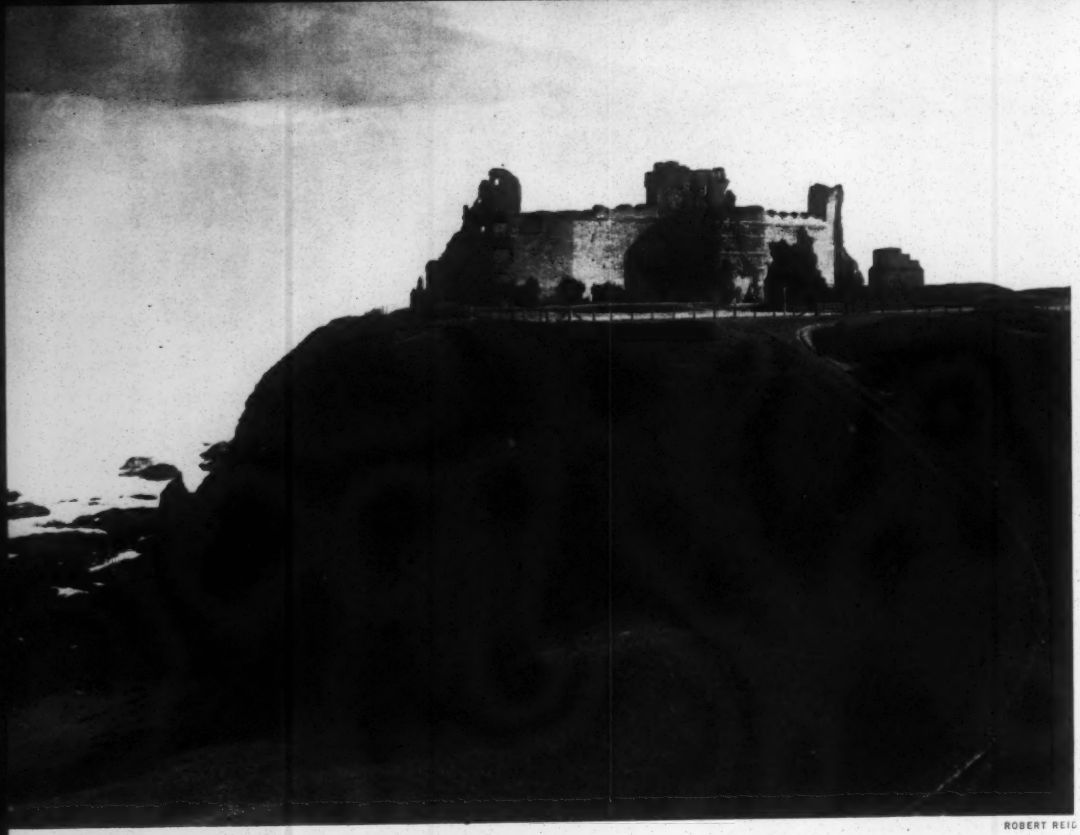
Castles attained their importance under the feudal system. Powerful chiefs lived in baronial splendor supported by their vassals. In return, the chiefs protected the vassals.

When gunpowder was invented in the 16th century, castles declined in military importance.

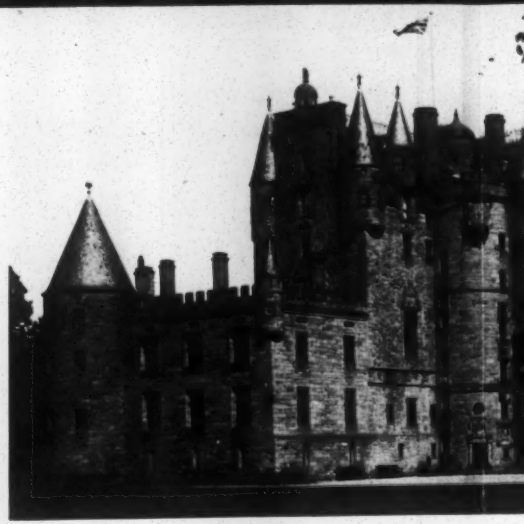
Today many are preserved as national monuments, such as Culzean (pronounced *Cullane*) at right. The nobles have moved out, and commoners tour through to see the arms and amenities of a dead way of life. One commoner who occasionally visits is President Eisenhower, who was given the lifetime use of an apartment there by the Scots in recognition of his service as Supreme Commander during World War II.

PHOTOGRAPH FROM JOHN RESSICH; BELOW, BRITISH INFORMATION SERVICES





ROBERT REID



Haunted Castles of Scotland

GRAY STONE PILES brood over the purple mountains and green glens of Scotland, haunted reminders of centuries of stirring battle, dark ambition, high revels, and bloody treachery.

Some are ruins, like Tantallon Castle at left. Others, like many-turreted Glamis, above, retain their link with noble families. Ancestral home of the Queen Mother of England, Glamis is the birthplace of Princess Margaret. Scotsmen say that invisible royalty uses it as well.

Each year, the legend goes, in a secret room, a ghastly card game is dealt. The

blackened by a half-century's layer of soot. Brunette walls turned out to be blond. Pittsburghers were startled to discover that the black Pennsylvania Railroad Station actually had a pinkish-buff surface of terra cotta and brick. Most natives thought the Bakewell Building, a skyscraper in the heart of downtown, was faced with dark granite. Washed, it turned out to be clay-colored sandstone.

Fifty-nine acres at the point of the Golden Triangle were condemned or bought. Thirty-six were made into a park on the site of old Fort Pitt. The rest of the area was zoned for office buildings.

Pittsburgh no longer deserves the name "Smoky City." More efficient coal burners, smoke-prevention devices, wider use of natural gas, fuel oil, and electricity, turned it into a far cleaner place where sunshine and blue skies can be enjoyed all day long.

Old buildings have a fresh-scrubbed look. New skyscrapers, sheathed in gleaming metal and glass, have gone up. Mammoth parking lots and a new expressway ease traffic problems.

Not far from the triangle, 95 acres of slums were razed to make way for a $20,000,000 civic auditorium. Scheduled for completion in 1961, the arena will feature a stainless steel dome which can be opened and closed within three minutes at the push of a button.

Industry's threat to leave Pittsburgh has ended. Today, 5,650 products are made in the area. More than 100 major industrial concerns make their headquarters in the city, shipping $350,000,000 worth of goods to international markets and making it one of the largest United States inland ports. L. B.

ALLEGHENY CONFERENCE ON COMMUNITY DEVELOPMENT

BEFORE AND AFTER: Two photographs, taken from the same spot 10 years apart, tell the dramatic story of Pittsburgh's triumph over smog. A motorist emerging from Liberty Tubes in 1945, left, finds darkness at noon. Above, today's drivers find bright sun and blue skies. Chief cause of the dismal haze was soft coal burned by industries. Smoke and soot were trapped in the river valleys. Stringent control laws and increased use of cleaner fuels have cleared the air.

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PITTSBURGH

PITTSBURGH BICENTENNIAL ASSOCIATION

STAINLESS steel-clad skyscrapers glitter in the sunlight. The greenery of Mellon Park thrives on top of a modern six-level parking garage. This is the new Pittsburgh.

For its year-long bicentennial celebration which ends next month, Pittsburgh wears a new face, the result of 12 years of major surgery.

In the early days of the operation, the late famous architect, Frank Lloyd Wright, declared that it would be cheaper to abandon the Pennsylvania steel town than rebuild it. At the time, many people would have agreed. An industrial giant, Pittsburgh was continually blackened by soft coal smoke from factory chimneys. Soot collected everywhere. A businessman could not keep a shirt white more than two or three hours. Downtown, street lights had to be turned on by 11 a.m. on winter days to cope with the ever-present darkening fog.

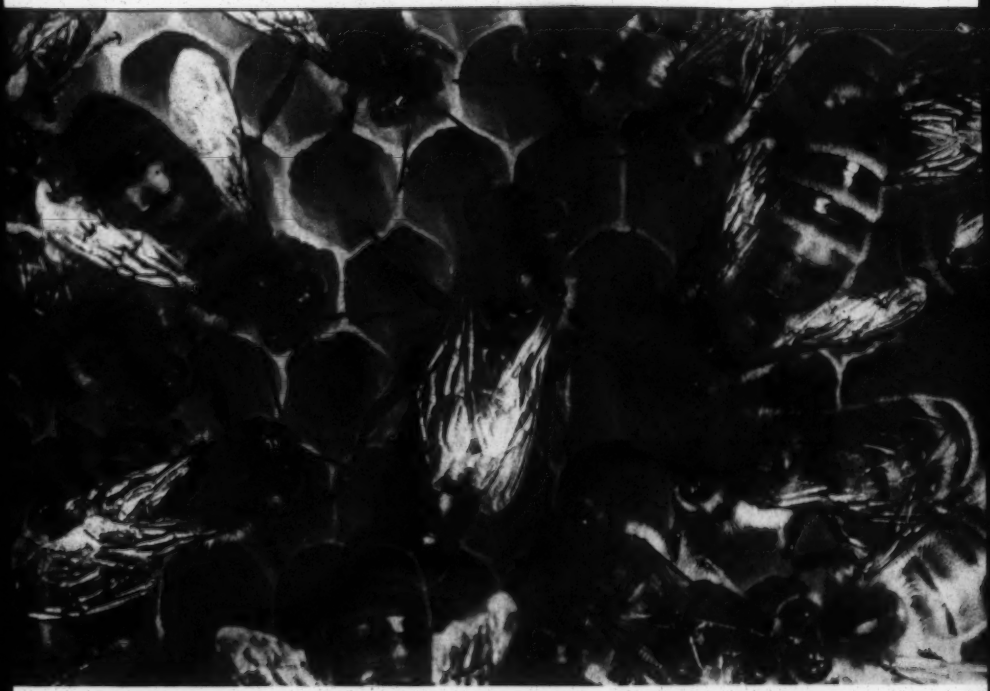
Downtown Pittsburgh, a triangular peninsula, above, where the Allegheny (left) and Monongahela Rivers meet to form the Ohio River, had disintegrated into a commercial slum. An elevated spur railway ran through it, switch engines spewing smoke. Hoboes hid there. Old warehouses blighted the scene where the British, during the French and Indian War, captured Fort Duquesne and renamed it Fort Pitt. Only a blockhouse remained of that romantic chapter in American history.

Pittsburgh's location made it rich—and dirty. The Pittsburgh seam of bituminous coal, necessary in steel making, lies near by. Perched at the river junction, Pittsburgh has a natural system for getting raw materials in and its products out.

Fleets of barges ply the rivers; trains chug along the banks. In spite of these natural advantages, industries were talking about moving out in 1947. Dirt, smog, and the city's run-down condition were too much to take.

Then civic and business leaders planned the major operation to remove Pittsburgh's deepening scars. Formerly ignored anti-smoke laws were enforced. New laws were passed. Heavy fines discouraged violators.

Steam hoses washed down buildings



THE ROYAL COURT—The queen, surrounded by workers, moves over the honey comb. Her highness's single task is to lay eggs. A tremendously efficient egg-laying machine, she may deposit 1,500 a day to keep the hive to full strength. In her lifetime, she can produce more than a million. Her attendants stay with her constantly, anxious to serve in every way. If she pauses to rest, they move in to caress, feed, and clean her. They feed her "royal jelly" a compound produced from their head glands.

BIRTH AND DEATH—Only seconds old, a drone (left) peers from his wax case with large, compound eyes. Drones do no work, living a life of carefree luxury. They cannot make honey, build comb, or defend the hive. Their only function is to fertilize the queen. Once this is done, the workers no longer tolerate drones, and drive them away or kill them. Below, a slain drone is removed by a member of the cleanup squad.

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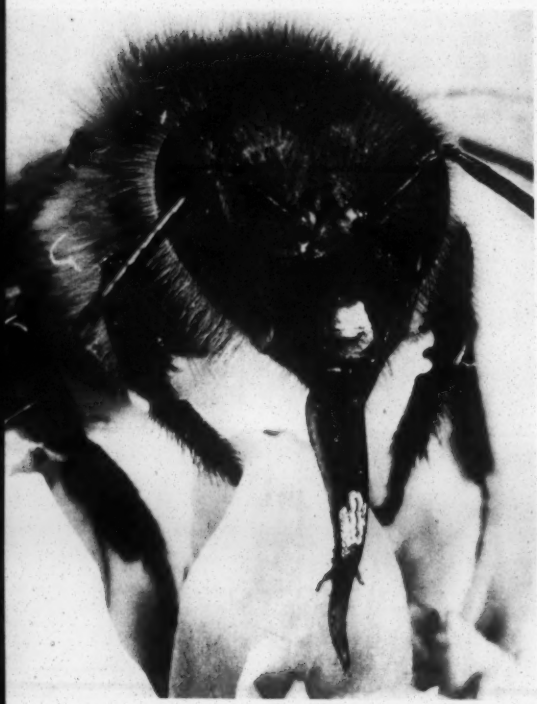
PHOTOGRAPHS BY TREAT DAVIDSON

An Intimate Look at the Honeybee



COATED WITH golden grains of pollen, a worker bee buzzes to a portulaca blossom to collect more treasure. Like a child playing in mud, she will roll in the living dust, getting it all over herself. Then, carefully combing out the grains, she will pack them in the "pollen basket" visible on her hind leg.

Richly laden, she will fly back to the hive, where her sisters will form the pollen into "bee bread" to feed the hive's young.

Even the flower benefits from this raid. The bee carries pollen from similar blossoms, which fertilize the flower, ensuring seeds and new plants next year.

In the extreme close-up at left, a thirsty bee dips its long tongue into a clover blossom in search of nectar —the raw material of honey.

The remarkable pictures on these three pages were made by photographer Treat Davidson, who used a special camera rig designed for the purpose by Edwin L. Wisherd, Chief of the National Geographic Society's photographic laboratory.

OUCH! This worker bee has sunk her stinger in the photographer's hand, and started to pull away. It is a suicide attack—the barbed sting stays in the flesh, pulling out the bee's intestines and killing her. Close-up below shows the muscle, pumping as long as 20 minutes after the bee is gone. Bee venom is as powerful as that of a rattlesnake, but there is, fortunately, a great deal less of it.

Female Bees Do All the Work

BEES ARE MAN'S hardest-working and most numerous livestock. In addition to gathering honey to feed him, they perform an even more important function: many plants will bear no crops unless fertilized by insects. Poison sprays and clean farming methods have cut down drastically the number of native insects available for the job. So beekeepers rent out their hives, trucking them around the country as the various crops flower.

Bee society is based on the labor of the females, or workers. They gather nectar and pollen, make the honeycomb, tend the queen and larvae while the males, or drones, loaf.

For gathering honey, bees are equipped with a double stomach. One is the bee's own stomach, the other, called the honey sac, stores nectar as she gathers it from flowers. Emptied on the return to the hive, the nectar is treated with enzymes that break down its sweetness into simple sugars.

Bees fan the solution with buzzing wings to evaporate part of the water and concentrate the nectar into honey. To produce a pound of honey requires the nectar gathered on 35,000 trips from the hive.

If you have a 16-ounce bottle of honey on your kitchen shelf, look at it with awe. It holds the essence of 2,000,000 flowers. F. S.

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